

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Atty. Docket: WALLACH32

In re Patent of:)	Conf. No.: 2522
)	
David WALLACH et al.)	
)	
Patent No.: 7,416,730)	Washington, D.C.
)	
Issued: August 26, 2008)	January 23, 2009
)	
For: DERIVATIVES OF THE IL-2)	
RECEPTOR GAMMA CHAIN,)	ATTN: Certificate of
HEIR PRODUCTION AND USE)	Correction Division

REQUEST FOR EXPEDITED ISSUANCE OF CERTIFICATE OF CORRECTION
UNDER 37 C.F.R. §1.322

Honorable Commissioner for Patents
U.S. Patent and Trademark Office
ATTN: Certificate of Correction Branch
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In checking over the printed copy of the above-identified patent, we have found the following errors that are entirely the fault of the Patent and Trademark Office. It is respectfully requested that these errors be corrected in accordance with 37 CFR §1.322(a) and that the issuance of the certificate be expedited in accordance with MPEP §1480.01. The errors to be corrected are listed below.

The PTO erred by publishing the wrong sequence listing. The sequence listing printed in the patent is the sequence listing filed June 22, 2005, and includes 21 sequences. However, that sequence listing was superseded by

the sequence listing filed with applicant's amendment of November 6, 2006, which listing includes 27 sequences. The new sequence listing filed November 6, 2006, differed from the original by the addition of six new sequences, SEQ ID NOS. 22-27.

We are attaching one copy of the Certificate of Correction form (pages 1-8), showing the correction to the beginning of the sequence listing, printed in the patent at columns 39-40, to show that there are 27 sequences in the listing, and adding the six additional sequences at the end of the sequence, at columns 51-52, which additional sequences should have been published because they were part of the sequence listing filed November 6, 2006, but were not published due to error on the part of the PTO.

In accordance with MPEP §1480.01, this certificate is entitled to expedited issuance as the error is attributable solely to the Office. As proof that unequivocally supports patentee's assertions, attached hereto is the following supporting documentation:

- 1) A full copy of the amendment filed on November 6, 2006, from the PAIR records of the Office, including the SCORE placeholder sheet for IFW content, indicating that an electronic sequence listing had been filed, and including the receipts proving that the amendment and sequence listing were received.

2) A paper dated November 20, 2006, from the PTO PAIR file for this application, indicating that this sequence listing, with 27 sequences, had been entered.

Accordingly, granting of this request and issuance of the attached certificate of correction on an expedited basis are earnestly solicited.

Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicant(s)

By /rlb/
Roger L. Browdy
Registration No. 25,618

RLB:jhw

Telephone No.: (202) 628-5197

Facsimile No.: (202) 737-3528

G:\BN\I\in12\Wallach32\Pto\2009-01-22CertCor322PTOFault.doc

RAW SEQUENCE LISTING

EFS

The Biotechnology Systems Branch of the Scientific and Technical
Information Center (STIC) no errors detected.

Application Serial Number: 10/511,722A
Source: IFW16
Date Processed by STIC: 11/20/06

ENTERED



IFW16

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/511,722A

DATE: 11/20/2006
TIME: 13:46:51

Input Set : N:\efs\10511722a.efs\2006-11-26SequenceListing.txt
Output Set: N:\CRF4\11202006\J511722A.raw

3 <110> APPLICANT: Yeda Research and Development Co. Ltd.
4 WALLACH, David
5 SHMUSHKOVICH, Taisia
6 RAMAKRISHNAN, Parameswaran
8 <120> TITLE OF INVENTION: Derivatives of the IL-2 receptor Gamma chain, their
preparation
9 and use
11 <130> FILE REFERENCE: WALLACH32
13 <140> CURRENT APPLICATION NUMBER: 10/511,722A
C--> 14 <141> CURRENT FILING DATE: 2005-06-22
16 <160> NUMBER OF SEQ ID NOS: 27
18 <170> SOFTWARE: PatentIn version 3.3
20 <210> SEQ ID NO: 1
21 <211> LENGTH: 86
22 <212> TYPE: PRT
23 <213> ORGANISM: Homo sapiens
25 <400> SEQUENCE: 1
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28 1 5 10 15
31 Val Thr Glu Tyr His Gly Asn Phe Ser Ala Trp Ser Gly Val Ser Lys
32 20 25 30
35 Gly Leu Ala Glu Ser Leu Gln Pro Asp Tyr Ser Glu Arg Leu Cys Leu
36 35 40 45
39 Val Ser Glu Ile Pro Pro Lys Gly Gly Ala Leu Gly Glu Gly Pro Gly
40 50 55 60
43 Ala Ser Pro Cys Asn Gln His Ser Pro Tyr Trp Ala Pro Pro Cys Tyr
44 65 70 75 80
47 Thr Leu Lys Pro Glu Thr
48 85
51 <210> SEQ ID NO: 2
52 <211> LENGTH: 41
53 <212> TYPE: PRT
54 <213> ORGANISM: Homo sapiens
56 <400> SEQUENCE: 2
58 Leu Cys Leu Val Ser Glu Ile Pro Pro Lys Gly Gly Ala Leu Gly Glu
59 1 5 10 15
62 Gly Pro Gly Ala Ser Pro Cys Asn Gln His Ser Pro Tyr Trp Ala Pro
63 20 25 30
66 Pro Cys Tyr Thr Leu Lys Pro Glu Thr
67 35 40
70 <210> SEQ ID NO: 3
71 <211> LENGTH: 12
72 <212> TYPE: PRT
73 <213> ORGANISM: Homo sapiens

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/511,722A

DATE: 11/20/2006
TIME: 13:46:51

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Output Set: N:\CRF4\11202006\J511722A.raw

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78 1 5 10
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84 <213> ORGANISM: Homo sapiens
85 <400> SEQUENCE: 4
87 tggggccccc catgttacac cctaaaggct gaaacctgta 39
90 <210> SEQ ID NO: 5
91 <211> LENGTH: 261
92 <212> TYPE: DNA
93 <213> ORGANISM: Homo sapiens
95 <400> SEQUENCE: 5
96 gaacggacgt tgcccccgaat tcccacccctg aagaacacctag aggtatctgt tactgaatac 60
98 cacggaaact tttccggctcg gagggtgtg tctaaggggac tggtcgagag ttgcaccca 120
100 gactacatgt aacgactctg ctcgtcagt gagatcccccaaaaaggagg ggccttggg 180
102 gggggccctg gggccctcccc atgcaacccag catagccct atctggggccc cccatgttac 240
104 acccttaaaggcctgaaacccctg a 261
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108 <211> LENGTH: 126
109 <212> TYPE: DNA
110 <213> ORGANISM: Homo sapiens
112 <400> SEQUENCE: 6
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115 tccccatgca accagcatag cccctactgg gcccccccat gttacaccct aaagcctgaa 120
117 acctgt 126
120 <210> SEQ ID NO: 7
121 <211> LENGTH: 37
122 <212> TYPE: DNA
123 <213> ORGANISM: Homo sapiens
125 <400> SEQUENCE: 7
126 ctctgtcgatg agattgcgcg aaaaggagg ggccttg 37
129 <210> SEQ ID NO: 8
130 <211> LENGTH: 37
131 <212> TYPE: DNA
132 <213> ORGANISM: Homo sapiens
134 <400> SEQUENCE: 8
135 caaggcccccc tccctttcgcg gcaatctcac tgacgag 37
138 <210> SEQ ID NO: 9
139 <211> LENGTH: 35
140 <212> TYPE: DNA
141 <213> ORGANISM: Homo sapiens
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144 gccccctactcg gggcgccgca tgttacaccct taaag 35
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148 <211> LENGTH: 35
149 <212> TYPE: DNA
150 <213> ORGANISM: Homo sapiens

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/511,722A

DATE: 11/20/2006
TIME: 13:46:51

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Output Set: N:\CRF4\11202006\J511722A.raw

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159 <213> ORGANISM: Homo sapiens		
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165 <210> SEQ ID NO: 12		
166 <211> LENGTH: 39		
167 <212> TYPE: DNA		
168 <213> ORGANISM: Homo sapiens		
170 <400> SEQUENCE: 12		
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174 <210> SEQ ID NO: 13		
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176 <212> TYPE: DNA		
177 <213> ORGANISM: Homo sapiens		
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183 <210> SEQ ID NO: 14		
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185 <212> TYPE: DNA		
186 <213> ORGANISM: Homo sapiens		
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194 <212> TYPE: DNA		
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202 <211> LENGTH: 33		
203 <212> TYPE: DNA		
204 <213> ORGANISM: Homo sapiens		
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211 <211> LENGTH: 44		
212 <212> TYPE: PRT		
213 <213> ORGANISM: Homo sapiens		
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218 1 5 10 15		
221 Asp Leu Val Thr Glu Tyr His Gly Asn Phe Ser Ala Trp Ser Gly Val		
222 20 25 30		
225 Ser Lys Gly Leu Ala Glu Ser Leu Gln Pro Asp Tyr		
226 35 40		

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/511,722A

DATE: 11/20/2006
TIME: 13:46:51

Input Set : N:\efs\10511722a_efs\2006-11-06SequenceListing.txt
Output Set: N:\CRF4\11202006\J511722A.raw

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231 <212> TYPE: PRT
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240 Gln Gln Val Gly Gly Leu Lys Ser Pro Trp Arg Gly Glu Tyr Lys Glu
241 20 25 30
244 Pro Arg His Pro Pro Pro Asn Gln Ala Asn Tyr His Gln Thr Leu His
245 35 40 45
248 Ala Gln Pro Arg Glu Leu Ser Pro Arg Ala Pro Gly Pro Arg Pro Ala
249 50 55 60
252 Glu Glu Thr Thr Gly Arg Ala Pro Lys Leu Gln Pro Pro Leu Pro Pro
253 65 70 75 80
256 Glu
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261 <211> LENGTH: 324
262 <212> TYPE: PRT
263 <213> ORGANISM: Homo sapiens
265 <400> SEQUENCE: 19
267 Pro Leu Thr Ala Gln Ala Ile Gln Glu Gly Leu Arg Lys Glu Pro Ile
268 1 5 10 15
271 His Arg Val Ser Ala Ala Glu Leu Gly Gly Lys Val Asn Arg Ala Leu
272 20 25 30
275 Gln Gln Val Gly Gly Leu Lys Ser Pro Trp Arg Gly Glu Tyr Lys Glu
276 35 40 45
279 Pro Arg His Pro Pro Pro Asn Gln Ala Asn Tyr His Gln Thr Leu His
280 50 55 60
283 Ala Gln Pro Arg Glu Leu Ser Pro Arg Ala Pro Gly Pro Arg Pro Ala
284 65 70 75 80
287 Glu Glu Thr Thr Gly Arg Ala Pro Lys Leu Gln Pro Pro Leu Pro Pro
288 85 90 95
291 Glu Pro Pro Pro Asn Lys Ser Pro Pro Leu Thr Leu Ser Lys Glu
292 100 105 110
295 Glu Ser Gly Met Trp Glu Pro Leu Pro Leu Ser Ser Leu Glu Pro Ala
296 115 120 125
299 Pro Ala Arg Asn Pro Ser Ser Pro Glu Arg Lys Ala Thr Val Pro Glu
300 130 135 140
303 Gln Glu Leu Gln Gln Leu Glu Ile Glu Leu Phe Leu Asn Ser Leu Ser
304 145 150 155 160
307 Gln Pro Phe Ser Leu Glu Glu Gln Glu Ile Leu Ser Cys Leu Ser
308 165 170 175
311 Ile Asp Ser Leu Ser Leu Ser Asp Asp Ser Glu Lys Asn Pro Ser Lys
312 180 185 190
315 Ala Ser Gln Ser Ser Arg Asp Thr Leu Ser Ser Gly Val His Ser Trp
316 195 200 205
319 Ser Ser Gln Ala Glu Ala Arg Ser Ser Ser Trp Asn Met Val Leu Ala
320 210 215 220

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/511,722A

DATE: 11/20/2006
TIME: 13:46:51

Input Set : N:\efs\10511722a_efs\2006-11-06SequenceListing.txt
Output Set: N:\CRF4\11202006\J511722A.raw

323 Arg Gly Arg Pro Thr Asp Thr Pro Ser Tyr Phe Asn Gly Val Lys Val
324 225 230 235 240
327 Gln Ile Gln Ser Leu Asn Gly Glu His Leu His Ile Arg Glu Phe His
328 245 250 255
331 Arg Val Lys Val Gly Asp Ile Ala Thr Gly Ile Ser Ser Gln Ile Pro
332 260 265 270
335 Ala Ala Ala Phe Ser Leu Val Thr Lys Asp Gly Gln Pro Val Arg Tyr
336 275 280 285
339 Asp Met Glu Val Pro Asp Ser Gly Ile Asp Leu Gln Cys Thr Leu Ala
340 290 295 300
343 Pro Asp Gly Ser Phe Ala Trp Ser Trp Arg Val Lys His Gly Gln Leu
344 305 310 315 320
347 Glu Asn Arg Pro
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352 <211> LENGTH: 357
353 <212> TYPE: PRT
354 <213> ORGANISM: Homo sapiens
356 <400> SEQUENCE: 20
358 Met Leu Lys Pro Ser Leu Pro Phe Thr Ser Leu Leu Phe Leu Gln Leu
359 1 5 10 15
362 Pro Leu Leu Gly Val Gly Leu Asn Thr Thr Ile Leu Thr Pro Asn Gly
363 20 25 30
366 Asn Glu Asp Thr Thr Ala Asp Phe Phe Leu Thr Thr Met Pro Thr Asp
367 35 40 45
370 Ser Leu Ser Val Ser Thr Leu Pro Leu Pro Glu Val Gln Cys Phe Val
371 50 55 60
374 Phe Asn Val Glu Tyr Met Asn Cys Thr Trp Asn Ser Ser Ser Glu Pro
375 65 70 75 80
378 Gln Pro Thr Asn Leu Thr Leu His Tyr Trp Tyr Lys Asn Ser Asp Asn
379 85 90 95
382 Asp Lys Val Gln Lys Cys Ser His Tyr Leu Phe Ser Glu Glu Ile Thr
383 100 105 110
386 Ser Gly Cys Gln Leu Gln Lys Lys Glu Ile His Leu Tyr Gln Thr Phe
387 115 120 125
390 Val Val Gln Leu Gln Asp Pro Arg Glu Pro Arg Arg Gln Ala Thr Gln
391 130 135 140
394 Met Leu Lys Leu Gln Asn Leu Val Ile Pro Trp Ala Pro Glu Asn Leu
395 145 150 155 160
398 Thr Leu His Lys Leu Ser Glu Ser Gln Leu Glu Leu Asn Trp Asn Asn
399 165 170 175
402 Arg Phe Leu Asn His Cys Leu Glu His Leu Val Gln Tyr Arg Thr Asp
403 180 185 190
406 Trp Asp His Ser Trp Thr Glu Gln Ser Val Asp Tyr Arg His Lys Phe
407 195 200 205
410 Ser Leu Pro Ser Val Asp Gly Gln Lys Arg Tyr Thr Phe Arg Val Arg
411 210 215 220
414 Ser Arg Phe Asn Pro Leu Cys Gly Ser Ala Gln His Trp Ser Glu Trp
415 225 230 235 240
418 Ser His Pro Ile His Trp Gly Ser Asn Thr Ser Lys Glu Asn Pro Phe

RAW SEQUENCE LISTING ERROR SUMMARY DATE: 11/20/2006
PATENT APPLICATION: US/10/511,722A TIME: 13:46:52

Input Set : N:\efs\10511722a_efs\2006-11-06SequenceListing.txt
Output Set: N:\CRF4\11202006\J511722A.raw

Invalid <213> Response:
Use of "Artificial" only as "<213> Organism" response is incomplete,
per 1.823(b) of New Sequence Rules. Valid response is Artificial Sequence.

Seq#:23,24,25,26,27

VERIFICATION SUMMARY

PATENT APPLICATION: US/10/511,722A

DATE: 11/20/2006

TIME: 13:46:52

Input Set : N:\efs\10511722a_efs\2006-11-06SequenceListing.txt

Output Set: N:\CRF4\11202006\J511722A.raw

L:14 M:271 C: Current Filing Date differs, Replaced Current Filing Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

ATTY.'S DOCKET: WALLACH32

In re Application of:) Art Unit: 1647
)
David WALLACH) Examiner: C. M. Woodward
)
Appln. No.: 10/511,722) Washington, D.C.
)
Date Filed: June 22, 2005) Confirmation No. 2522
)
For: DERIVATIVES OF THE IL-2) November 6, 2006
RECEPTOR GAMMA CHAIN...

AMENDMENT

Honorable Commissioner for Patents
U.S. Patent and Trademark Office
Customer Service Window
Randolph Building, Mail Stop **Amendment**
401 Dulany Street
Alexandria, VA 22314

Sir:

In response to the Office Action of August 7, 2006,
please amend as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims
which begins on page 16 of this paper.

Amendments to the Sequence Listing begin on page 19 of this
paper.

Remarks/Arguments begin on page 20 of this paper.

Attachment: A computer readable copy of the Sequence Listing in
".txt form" is being submitted herewith.

In the Specification

Please replace the paragraph beginning on page 1 at line 10 with the following amended paragraph:

Nuclear factor κ B (NF- κ B) is a family of inducible eukaryotic transcription factor complexes participating in regulation of immune response, cell growth, and survival [Ghosh et al. 1998]. The NF- κ B factors are normally sequestered in the cytoplasmic compartment by physical association with a family of cytoplasmic ankyrin rich inhibitors termed I κ B, including I κ B α and related proteins [Baldwin et al. 1996]. In response to diverse stimuli, including cytokines, mitogens, and certain viral gene products, I κ B is rapidly phosphorylated at serines 32 and 36, ubiquitinated and then degraded by the 26S proteasome, which allows the liberated NF- κ B to translocate to the nucleus and participate in target gene transactivation [Mercurio et al 1999, Pahl et al 1999]. Recent molecular cloning studies have identified a multi subunit I κ B kinase (IKK) that mediates the signal-induced phosphorylation of I κ B. The IKK is composed of two catalytic subunits, IKK α and IKK β , and a regulatory subunit IKK γ . The catalytic activity of both IKK α and IKK β can be activated by a multitude of different NF- κ B inducers, including the inflammatory cytokines, tumor necrosis factor and

interleukin-1, the T cell receptor and the T cell costimulatory protein, CD28 [Karin et al 2000].

Please replace the paragraph beginning on page 3 at line 16 with the following amended paragraph:

Assessment of the pattern of the NF- κ B species in lymphoid organs of aly/aly mice indicated that, apart from its role in the regulation of NF- κ B complex(s) comprised of Rel proteins (A+p50) and I κ B, NIK also participates in controlling the expression/activation of other NF- κ B species. Most notably, the lymphocytes of the aly/aly mice were deficient of p52, an NF- κ B species that is specifically formed in mature B-lymphocytes through proteolytic processing of an inactive precursor, p100 (NF- κ B2), suggesting a deficiency in p100 - p52 conversion [Yamada et al. 2000]. Indeed, NIK has been shown to participate in site specific phosphorylation of p100. Both both directly and through phosphorylation and through phosphorylation of IKK α , which in turn phosphorylates p100. This phosphorylation serves as a molecular trigger for ubiquitination and active processing of p100 to form p52. This p100 processing activity was found to be ablated by the aly mutation [Xiao et al. 2001, Senftleben et al. 2001].

Please replace the paragraph beginning on page 8 at line 1 with the following amended paragraph:

Mouse and human IL2 both cause proliferation of T-cells of the homologous species at high efficiency. Human IL2 also stimulates proliferation of mouse T-cells at similar

concentrations, whereas mouse IL2 stimulates human T-cells at a lower (sixfold to 170-fold) efficiency. The involvement of IL-2 in autoimmunity is controversial (reviewed by O'Shea et al. 2002). It is recognized that IL-2 administration is associated with a variety of autoimmune disorders such as immune thyroiditis,

| rheumatoid arthritis and other arthropathies arthropathies.

However IL-2 deficient mice produce multiple autoantibodies, including anti-DNA antibodies. About half die of autoimmune haemolytic anemia and the survivors develop inflammatory bowel disease. Importantly, the pathology is corrected by the addition of exogenous IL-2. This indicates a role of IL-2 in maintaining peripheral tolerance.

Please replace the paragraph beginning on page 8 at line 11 with the following amended paragraph:

| IL2 is a growth factor for all subpopulations of T-lymphocytes. The IL2R-alpha receptor subunit is expressed in adult T-cell leukemia (ATL). Since freshly isolated leukemic cells also secrete IL2 and respond to it, IL2 may function as an autocrine growth modulator for these cells capable of worsening ATL.

Please replace the paragraph beginning on page 9 at line 16 with the following amended paragraph:

X-linked severe combined immunodeficiency (XSCID) is a rare and potentially fatal disease caused by mutations of IL2RG chain, the gene encoding the IL-2R γ chain, a component of multiple cytokine receptors that are essential for lymphocyte development and function (Noguchi et al. 1993). To date, over 100 different mutations of IL2RG resulting in XSCID have been published. Recent gene knock out studies indicate a pivotal role of the cyc gene in lymphopoiesis [DiSanto et al 1995].

Please replace the paragraph beginning on page 10 at line 1 with the following amended paragraph:

The present invention relates to the use of IL-2 common gamma chain (cyc) (SEQ ID NO: 22) or a mutein, variant, fusion protein, preferably 41MDD (SEQ ID NO:2), 44MPD(SEQ ID NO:17), the intracellular domain of cyc (ICDcyc) (SEQ ID NO:1), 1-357 (SEQ ID NO:20) 1-341(SEQ ID NO:21, functional derivative, circularly permuted derivative or fragment thereof for modulating the interaction between cyc and NIK.

Please replace the paragraph beginning on page 10 at line 8 with the following amended paragraph:

In addition the invention relates to the use of a DNA encoding cyc or a mutein, variant, fusion protein, circularly permuted derivative or fragment thereof, a DNA

encoding the antisense of cyc, an antibody specific to cyc, or a small molecule obtainable by screening products of combinatorial chemistry in a luciferase system, for modulating the interaction between IL-2 common gamma chain (cyc) and NIK.

Please replace the paragraph beginning on page 17 at line 15 with the following amended paragraph:

Figure 11 shows the amino acid sequence of the intracellular domain of cyc (SEQ ID NO: 1).

Please replace the paragraph beginning on page 17 at line 16 with the following amended paragraph:

Figure 12 shows the amino acid sequence of the 41 amino acid polypeptide from the membrane distal domain of cyc (41MDD) (SEQ ID NO: 2).

Please replace the paragraph beginning on page 17 at line 20 with the following amended paragraph:

Figure 13 shows the nucleotide sequence of the intracellular domain of cyc (cycICD) (SEQ ID NO: 5).

Please replace the paragraph beginning on page 17 at line 22 with the following amended paragraph:

Figure 14 shows the nucleotide sequence of the 41 polypeptide from the membrane distal domain of cyc (41MDD) (SEQ ID NO: 6).

Please replace the paragraph beginning on page 17 at line 25 with the following amended paragraph:

Figure 15 shows the sequence of 12 amino acids-amino acids at the C-terminus of cyc involved in binding NIK (SEQ ID NO: 3).

Please replace the paragraph beginning on page 18 at line 21 with the following amended paragraph:

Cyc and NIK interaction was detected using a C-terminal fragment of NIK (624-947) as bait in a two-hybrid screen of a bone marrow cDNA library. This interaction was confirmed by co-immunoprecipitation studies carried out in lysates of mammalian cells overexpressing NIK and cyc and also by co-immunoprecipitation studies in cells naturally expressing NIK and cyc. Immunoprecipitation studies revealed that cyc (SEQ ID NO: 22) is efficiently co-precipitated with either the C-terminus of NIK (624-947) or with the full length of NIK.

Please replace the paragraph beginning on page 19 at line 4 with the following amended paragraph:

Multiple deletion mutants of both cyc and NIK were generated to define the binding domains in both proteins. The interactions were tested by yeast 2 hybrid tests and/or by immunoprecipitation studies (see examples below). Domains of cyc responsible for binding NIK were found in the membrane proximal domain (MPD) of cyc comprising 44 amino acid residues (from residue 282 to 325 of SEQ ID NO: 22), named 44MPD (see SEQ ID NO: 17) and, ~~e~~-in a membrane distal domain (MDD) comprising 41 amino acid (from residues 329 to 369 of SEQ ID NO: 22), named 41MDD (see SEQ ID NO: 2 and Figure 12). When 12 amino acids at the end of cyc (cyc residues 358-369, Fig 15 SEQ ID: NO 3 nucleotide sequence in SEQ ID NO: 4) were deleted from the intracellular domain of cyc (cycICD), the binding to NIK decreases by 50% indicating that these residues play a major role in binding.

Please replace the paragraph beginning on page 19 at line 14 with the following amended paragraph:

In addition, mutagenesis was carried out in residues located within the 41MDD, to define the specific amino acids interacting with NIK. The interaction of proline rich motifs in signaling proteins with their cognate domains is well documented (Kay BK, Williamson MP, Sudol M. FASEB J 2000 Feb 14 (2): 231-421). 20% of the amino acids in the membrane distal 41 amino acids of cyc are prolines. Therefore, two consecutive prolines

were mutated to alanine at two different sites within the 41

membrane distal amino acids of cyc: 1- PP336,337AA (SEQ ID NO:

23) and 2- PP360,361AA (SEQ ID NO: 24) and the effect of the

mutation on binding of NIK tested by the two hybrid assay. The

results obtained of cyc mutagenesis demonstrate that the prolines

at residues 360 and 361 are important for the binding to NIK.

Thus the muteins of the present invention ~~retains~~ retain prolines at residues 360 and 361.

Please replace the paragraph beginning on page 19 at line 26 with the following amended paragraph:

cyc and NIK interaction was shown to be functionally significant. Reporter gene assays showed that cyc modulates NIK-induced NF- κ B activation. It is possible, under experimental conditions, to induce NF- κ B activation by overexpressing NIK.

Activation of NF- κ B can be monitored in cells transfected with a

construct encoding ~~—lucifrase~~ luciferase under the control of an NF- κ B inducible promoter. Using this luciferase system, NF- κ B activation was monitored in cells overexpressing NIK alone or together with different concentration of cyc (for details see examples below). It was found that modulation of NF- κ B depends on the concentration of NIK vis a vis the concentration of cyc within the cells (NIK/cyc). For example, enhancement of NIK

mediated NF- κ B activation was observed when NIK/cyc was above 1 while inhibition of NIK mediated NF- κ B activation was observed when NIK/cyc was about equal or below 1.

Please replace the paragraph beginning on page 20 at line 26 with the following amended paragraph:

Progressively C-terminus deleted cyc fragments, 1-357, 1-341, 1-325, 1-303, were tested for their ability to modulate NF- κ B mediated by NIK in the luciferase system. For this purpose luciferase expression and activation of NF- κ B was measured in transfected cells overexpressing NIK and cyc or cyc deleted mutants at a ratio of about 1. Under these conditions cyc inhibits NF- κ B activation induced by NIK. It was found that full length cyc (SEQ ID NO: 22) and fragments 1-357 (SEQ ID NO:20)~~7~~ and 1-341 (SEQ ID NO:21) were able to inhibit NIK mediated NF- κ B activation while mutants lacking the NIK binding domain such as 1-325 and 1-303 did not have any effect on the activity of NIK mediated NF- κ B activation. The lack of effect of fragments 1-325 and 1-303 confirms the involvement of the membrane distal domain of cyc-NIK interaction and the role of this interaction in NF- κ B modulation.

Please replace the paragraph beginning on page 22 at line 4 with the following amended paragraph:

The results obtained revealed that signalling ~~through~~ through cyc involves NIK and recruitment of signalosome proteins and consequently modulation of NF- κ B. Therefore cyc or fragments thereof for example those comprising NIK binding domain such as MDD41 or MPD44 (SEQ ID NO:17) could be used to modulate signalling ~~through~~ through cyc

Please replace the paragraph beginning on page 23 at line 13 with the following amended paragraph:

The definition "functional derivatives" as herein used refers to derivatives which can be prepared from the functional groups present on the lateral chains of the amino acid moieties or on the terminal N- or C- groups according to known methods and are comprised in the invention when they are pharmaceutically acceptable i.e. when they do not destroy the protein activity or do not impart toxicity to the pharmaceutical compositions containing them. Such derivatives include for example esters or aliphatic amides of the carboxyl-groups and N-acyl derivatives of free amino groups or O-acyl derivatives of free hydroxyl-groups and are formed with acyl-groups as for example alcanoylalkanoyl- or aroyl-groups.

Please replace the paragraph beginning on page 33 at line 16 with the following amended paragraph:

A therapeutic or research-associated use of these tools necessitates their introduction into cells of a living organism. For this purpose, it is desired to improve membrane permeability of peptides, proteins and oligonucleotides. Derivatization with lipophilic structures may be used in creating peptides and proteins with enhanced membrane permeability. For instance, the sequence of a known membranotropic peptide as noted above may be added to the sequence of the peptide or protein. Further, the peptide or protein may be derivatized by partly lipophilic structures such as the above-noted hydrocarbon chains, which are substituted with at least one polar or charged group. For example, lauroyl derivatives of peptides have been described by Muranishi et al., 1991. Further modifications of peptides and proteins comprise the oxidation of methionine residues to thereby create sulfoxide groups, as described by Zacharia et al. 1991. Zacharia and co-workers also describe peptide or derivatives wherein the relatively hydrophobic peptide bond is replaced by its ketomethylene isoester—(COCH₂)₂(COCH₂). These and other modifications known to the person of skill in the art of protein and peptide chemistry enhance membrane permeability.

Please replace the paragraph beginning on page 44 at line 1 with the following amended paragraph:

The detection of a specific interaction between two different mammalian proteins in a two-hybrid system in yeast does not necessarily imply that there exists a corresponding interaction between the proteins in a native mammalian environment. Therefore, in order to verify NIK and cyc interaction in a mammalian environment, co-immunoprecipitation studies of NIK and cyc were carried out in lysates of 293-T cells ~~everexpressing~~ overexpressing these proteins (for details see Example 9)

Please replace the paragraph beginning on page 49 at line 13 with the following amended paragraph:

For the generation of the PP336,337AA mutants (SEQ ID NO: 23) the following primers were used:

Please replace the paragraph beginning on page 49 at line 18 with the following amended paragraph:

For the generation of the PP360,361AA mutants (SEQ ID NO: 24) the following primers were used:

Please replace the paragraph beginning on page 49 at line 26 with the following amended paragraph:

For the generation of the K338A mutant (SEQ ID NO: 25)
the following primers were used:

Please replace the paragraph beginning on page 50 at
line 1 with the following amended paragraph:

For the generation of the E344A mutant (SEQ ID NO: 26)
the following primers were used:

Please replace the paragraph beginning on page 50 at
line 5 with the following amended paragraph:

For the generation of the W358A mutant (SEQ ID NO: 27)
the following primers were used

Please replace the paragraph beginning on page 55 at
line 14 with the following amended paragraph:

A cell line was prepared from mouse embryonic
fibroblast cells, which are generally known to express the LT β
receptor. 10^5 cells of the above line were seeded per well in 6
well plates. 24 hours later transfection was performed (with
Gene porter transfection reagent, Gene therapy systems) with the
plasmid pcGST ICcgc expressing the intracellular domain of cyc
(cyc-IDG-ICD) fused to GST or with pcGST41MDD expressing the 41
distal domain of cyc fused to GST and the expression plasmid
encoding luciferase reporter protein under the control of an NF-

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Amd. dated November 6, 2006

Reply to Office Action of June 25, 2003

κ B inducible promoter (pcDNA3 luciferase). NF- κ B activation was measured indirectly by measuring the luciferase activity present in the cells.

Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-103 (Cancelled).

104 (New). A polypeptide capable of binding to NIK, comprising:

(a) the intracellular domain of cyc (residues 284-369 SEQ ID NO: 22);

(b) a fragment of (a) that retains the ability to bind NIK;

(c) a variant of (a) or (b) maintaining at least 90% identity with a) or b) and retaining the ability to bind NIK;

(d) a salt or functional derivative of (a), (b) or (c) that retains the ability to bind NIK; or

(e) a circularly permuted derivative of (a), (b) or (c) that retains the ability to bind NIK,

wherein said polypeptide contains no more of the sequence of cyc (SEQ ID NO: 22) than the intracellular domain thereof (residues 284-369 of SEQ ID NO: 22).

105 (New). A polypeptide in accordance with claim 104, comprising 41MDD (residues 329-369 of SEQ ID NO: 22).

106 (New). A polypeptide in accordance with claim 104, comprising ICDcyc (residues 284-369 of SEQ ID NO: 22).

107 (New). A polypeptide in accordance with claim 104, comprising the polypeptide of residues 289-369 of SEQ ID NO: 22.

108 (New). A polypeptide in accordance with claim 104, comprising the polypeptide of SEQ ID NO: 23.

109 (New). A polypeptide in accordance with claim 104, comprising the polypeptide of SEQ ID NO: 25.

110 (New). A polypeptide in accordance with claim 104, comprising the polypeptide of SEQ ID NO: 26.

111 (New). A polypeptide in accordance with claim 104, comprising the polypeptide of SEQ ID NO: 27.

112 (New). A DNA encoding a polypeptide in accordance with claim 104.

113 (New). A vector comprising the DNA in accordance with claim 112.

114 (New). A cell comprising a vector in accordance with claim 113.

115 (New). A method for the production of a polypeptide capable of binding to NIK, comprising culturing a cell according to claim 114 and collecting the polypeptide produced.

116 (New). An antibody that specifically recognizes an epitope within the intracellular domain of cyc (residues 284-369 of SEQ ID NO: 22), or an epitope-binding fragment thereof.

117 (New). An antibody or fragment thereof in accordance with claim 116, capable of inhibiting the binding of cyc to NIK.

118 (New). An antibody or fragment thereof in accordance with claim 116, that specifically recognizes an epitope within the sequence of 41MDD (residues 329-369 of SEQ ID NO: 22).

119 (New). An antibody or fragment thereof in accordance with claim 116, wherein said antibody comprises a monoclonal or polyclonal chimeric, fully-humanized, or anti-anti-Id antibody, or an intrabody.

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Amd. dated November 6, 2006
Reply to Office Action of June 25, 2003

IN THE SEQUENCE LISTING

Please substitute the attached Sequence Listing section
for the last filed Sequence Listing.

REMARKS

Claims 104-119 presently appear in this case. No claims have yet been acted upon on the merits. The official action of August 7, 2006, has now been carefully studied. The claims have been subject to a restriction requirement.

Reconsideration and withdrawal of the restriction requirement to the extent requested below and examination of all the claims now present in the case are hereby respectfully urged.

The examiner has made a unity of invention restriction requirement. Among the groups are Group II, drawn to a polypeptide fragment; Group III, drawn to a nucleic acid, vector or host cell; and Group V, drawn to an antibody. The examiner states that the groups do not relate to a single general inventive concept under PCT Rule 13.1 because they lack the same or corresponding special technical feature. The examiner states that claim 22 lacks novelty as being anticipated by Sugamura. The examiner states that Sugamura teaches anti-human cyc antibodies capable of inhibiting the binding between IL-2 receptor β and γ chains. This unity of invention restriction requirement is respectfully traversed.

The claims have now been amended to specify that the polypeptide is capable of binding to NIK and comprises the intracellular domain of cyc or a fragment, variant, derivative or circularly permuted derivative thereof that retains the ability to bind NIK. The claim specifies that the polypeptide contains no more of the sequence of cyc than the intracellular domain thereof.

Thus, the present claims do not exclude the extracellular domain of cyc.

Sugamura discloses the full cyc molecule and the portion cited by the examiner at column 10, lines 46-56, relates to ligand interaction, i.e., extracellular events. The antibodies of Sugamura do not bind to the intracellular domain. Thus, nothing in Sugamura anticipates or makes obvious any aspect of the presently claimed invention.

The method of using claims and small molecule claims have now been deleted without prejudice toward the continuation of prosecution thereof in a divisional application. The remaining claims include what the examiner had designated as Groups II, III and V. In order to be responsive, applicant hereby elects Group II, drawn to a polypeptide fragment. Claims 104-111 read on the elected group. However, in view of the fact that all of the present claims share the same or corresponding special technical feature, the restriction requirement should be withdrawn and all of the present claims examined.

The examiner states that in addition to an election of one of the above listed inventions, applicant must elect one corresponding SEQ ID NO. to be searched. In order to be responsive applicant hereby elects the 41MDD polypeptide, which is residues 329-369 of SEQ ID NO: 22.

It has been noted that the present specification includes sequences that are not identified by SEQ ID NOs. In order to facilitate description of these sequences, applicant has added to the sequence listing SEQ ID NO: 22, which is the full

length 369 amino acid cyc protein. Note that the sequences originally filed included the sequence of residue 1-357 of cyc (originally filed SEQ ID NO: 20), as well as the 12 amino acids at the C-terminus of cyc, i.e., residues 358-369 (SEQ ID NO: 3). Thus, the full sequence of 1-369 appeared in the specification as originally filed and new SEQ ID NO: 22 contains no new matter. The specification and claims have now been amended to refer to the various fragments as being fragments of SEQ ID NO: 22, so as to avoid confusion. Furthermore, the mutants appearing in Table 3 have been given their own SEQ ID NOS, 23-27. Many of these mutants are now being claimed.

Applicants have added into the present specification a new paper copy Sequence Listing section according to 37 C.F.R. §1.821(c) as new pages. Furthermore, attached hereto is a file (either on a 3½" disk or in an online text file) containing the "Sequence Listing" in computer readable form in accordance with 37 C.F.R. §1.821(e).

Applicants have amended the specification to insert SEQ ID Nos, as supported in the present specification.

The following statement is provided to meet the requirements of 37 C.F.R. §1.825(a) and 1.825(b).

I hereby state, in accordance with 37 C.F.R. §1.825(a), that the amendments included in the substitute sheets of the sequence listing are believed to be supported in the application as filed and that the substitute sheets of the sequence listing are not believed to include new matter.

I hereby further state, in accordance with 37 C.F.R. §1.825(b), that the attached copy of the computer readable form is the same as the attached substitute paper copy of the sequence listing.

Under U.S. rules, each sequence must be classified in <213> as an "Artificial Sequence", a sequence of "Unknown" origin, or a sequence originating in a particular organism, identified by its scientific name.

Neither the rules nor the MPEP clarify the nature of the relationship which must exist between a listed sequence and an organism for that organism to be identified as the origin of the sequence under <213>.

Hence, counsel may choose to identify a listed sequence as associated with a particular organism even though that sequence does not occur in nature by itself in that organism (it may be, e.g., an epitopic fragment of a naturally occurring protein, or a cDNA of a naturally occurring mRNA, or even a substitution mutant of a naturally occurring sequence). Hence, the identification of an organism in <213> should not be construed as an admission that the sequence *per se* occurs in nature in said organism.

Similarly, designation of a sequence as "artificial" should not be construed as a representation that the sequence has no association with any organism. For example, a primer or probe may be designated as "artificial" even though it is necessarily

complementary to some target sequence, which may occur in nature. Or an "artificial" sequence may be a substitution mutant of a natural sequence, or a chimera of two or more natural sequences, or a cDNA (i.e., intron-free sequence) corresponding to an intron-containing gene, or otherwise a fragment of a natural sequence.

The Examiner should be able to judge the relationship of the enumerated sequences to natural sequences by giving full consideration to the specification, the art cited therein, any further art cited in an IDS, and the results of his or her sequence search against a database containing known natural sequences.

Accordingly, reconsideration and withdrawal of the restriction requirement and prompt examination on the merits and allowance of the claims now present in the case is earnestly solicited.

Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicant(s)

By /rlb/

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G:\BN\1\in12\Wallach32\Pto\2006-11-06amendment.doc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: David WALLACH

Art Unit: 1647

Application No.: 10/511,722

Conf. No. 2522

Examiner: C. M. Woodward

Filed: June 22, 2005

Washington, D.C.

For: DERIVATIVES OF THE IL-2 RECEPTOR GAMMA CHAIN, THEIR...

Atty.'s Docket: WALLACH32

Date: November 6, 2006

THE COMMISSIONER OF PATENTS
 U.S. Patent and Trademark Office
 Randolph Building, Mail Stop Amendments
 401 Dulany Street
 Alexandria, VA 22314

Sir:

Transmitted herewith is a [XX] Amendment [] _____

in the above-identified application.

[] Small Entity Status: Applicant(s) claim small entity status. See 37 C.F.R. §1.27.
 [] No additional fee is required.
 [] The fee has been calculated as shown below:

(Col. 1)	(Col. 2)	(Col. 3)
CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA EQUALS
TOTAL * 16	MINUS ** 123	0
INDEP. * 3	MINUS *** 33	0
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM		

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
x 25	\$		x 50	\$
x 100	\$		x 200	\$
+ 180	\$		+ 360	\$
ADDITIONAL FEE TOTAL			TOTAL	

* If the entry in Col. 1 is less than the entry in Col. 2, write "0" in Col. 3.
 ** If the "Highest Number Previously Paid for" IN THIS SPACE is less than 20, write "20" in this space.
 *** If the "Highest Number Previously Paid for" IN THIS SPACE is less than 3, write "3" in this space.

The "Highest Number Previously Paid For" (total or independent) is the highest number found from the equivalent box in Col. 1 of a prior amendment of the number of claims originally filed.

[XX] Conditional Petition for Extension of Time

If any extension of time for a response is required, applicant requests that this be considered a petition therefor.

[XX] It is hereby petitioned for an extension of time in accordance with 37 CFR 1.136(a). The appropriate fee required by 37 CFR 1.17 is calculated as shown below:

Small Entity

Response Filed Within

[] First - \$ 80.00
 [] Second - \$ 225.00
 [] Third - \$ 510.00
 [] Fourth - \$ 795.00

Month After Time Period Set

Other Than Small Entity

Response Filed Within

[] First - \$ 120.00
 [XX] Second - \$ 450.00
 [] Third - \$ 1020.00
 [] Fourth - \$ 1590.00

Month After Time Period Set

[] Less fees (\$_____) already paid for ____ month(s) extension of time on _____.

[] Please charge my Deposit Account No. 02-4035 in the amount of \$_____.

[XX] Credit Card Payment Form, PTO-2038, is attached, authorizing payment in the amount of \$ 450.00.

[] A check in the amount of \$_____ is attached (check no.).

[XX] The Commissioner is hereby authorized and requested to charge any additional fees which may be required in connection with this application or credit any overpayment to Deposit Account No. 02-4035. This authorization and request is not limited to payment of all fees associated with this communication, including any Extension of Time fee, not covered by check or specific authorization, but is also intended to include all fees for the presentation of extra claims under 37 CFR §1.16 and all patent processing fees under 37 CFR §1.17 throughout the prosecution of the case. This blanket authorization does *not* include patent issue fees under 37 CFR §1.18.

BROWDY AND NEIMARK, P.L.L.C.

Attorneys for Applicant(s)

Facsimile: (202) 737-3526
 Telephone: (202) 628-5197

By: /s/r/
 Roger L. Browdy
 Registration No. 25,618

SCORE Placeholder Sheet for IFW Content

Application Number: 10511722

Document Date: 11/06/2006

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- **Sequence Listing**

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions developed by SIRA.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (<http://es/ScoreAccessWeb/>).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Electronic Patent Application Fee Transmittal

Application Number:	10511722
Filing Date:	22-Jun-2005
Title of Invention:	Derivatives of the il-2 receptor gamma chain, their production and use
First Named Inventor/Applicant Name:	David Wallach
Filer:	Roger Lowen Browdy/Janet Dorgan
Attorney Docket Number:	WALLACH32

Filed as Large Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
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Basic Filing:

Pages:

Claims:

Miscellaneous-Filing:

Petition:

Patent-Appeals-and-Interference:

Post-Allowance-and-Post-Issuance:

Extension-of-Time:

Extension - 2 months with \$0 paid	1252	1	450	450
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Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				450

Electronic Acknowledgement Receipt

EFS ID:	1295438
Application Number:	10511722
International Application Number:	
Confirmation Number:	2522
Title of Invention:	Derivatives of the il-2 receptor gamma chain, their production and use
First Named Inventor/Applicant Name:	David Wallach
Customer Number:	1444
Filer:	Roger Lowen Browdy/Janet Dorgan
Filer Authorized By:	Roger Lowen Browdy
Attorney Docket Number:	WALLACH32
Receipt Date:	06-NOV-2006
Filing Date:	22-JUN-2005
Time Stamp:	16:00:37
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	\$450
RAM confirmation Number	278
Deposit Account	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)

1		2006-11-06amendment.pdf	136588	yes	24
Multipart Description/PDF files in .zip description					
Document Description		Start		End	
	Amendment - After Non-Final Rejection	1		1	
	Specification	2		15	
	Claims	16		18	
	CRF Statement Paper and CRF are the same	19		19	
	Applicant Arguments/Remarks Made in an Amendment	20		24	

Warnings:**Information:**

2	Sequence Listing	2006-11-06SequenceListing.txt	21420	no	0
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Warnings:**Information:**

3	Miscellaneous Incoming Letter	2006-11-06CoverAmendmen t.pdf	88127	no	1
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Warnings:**Information:**

4	Fee Worksheet (PTO-875)	fee-info.pdf	8188	no	2
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Warnings:**Information:****Total Files Size (in bytes):** 254323

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,416,730

Page 1 of 8

APPLICATION NO.: 10/511,722

ISSUE DATE : August 26, 2008

INVENTOR(S) : WALLACH et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Please correct at columns 39-40 under SEQUENCE LISTING at line <160>, after "NUMBER OF SEQ ID NOS.", delete "21" and insert --27--.

At columns 51-52, after the last line of the sequence listing, please insert the following:

<210> 22
<211> 369
<212> PRT
<213> Homo sapiens

<400> 22
Met Leu Lys Pro Ser Leu Pro Phe Thr Ser Leu Leu Phe Leu Gln Leu
1 5 10 15

Pro Leu Leu Gly Val Gly Leu Asn Thr Thr Ile Leu Thr Pro Asn Gly
20 25 30

Asn Glu Asp Thr Thr Ala Asp Phe Phe Leu Thr Thr Met Pro Thr Asp
35 40 45

Ser Leu Ser Val Ser Thr Leu Pro Leu Pro Glu Val Gln Cys Phe Val
50 55 60

Phe Asn Val Glu Tyr Met Asn Cys Thr Trp Asn Ser Ser Ser Glu Pro
65 70 75 80

Gln Pro Thr Asn Leu Thr Leu His Tyr Trp Tyr Lys Asn Ser Asp Asn
85 90 95

MAILING ADDRESS OF SENDER (Please do not use customer number below):

BROWDY AND NEIMARK, P.L.L.C.
624 Ninth Street, NW, Suite 300
Washington, D.C. 20001-5303

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including time for responding to the request for information. This collection is being filed with the Office of Management and Budget (OMB) for review under the Paperwork Reduction Act. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,416,730

Page 2 of 8

APPLICATION NO.: 10/511,722

ISSUE DATE : August 26, 2008

INVENTOR(S) : WALLACH et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Asp Lys Val Gln Lys Cys Ser His Tyr Leu Phe Ser Glu Glu Ile Thr
100 105 110

Ser Gly Cys Gln Leu Gln Lys Lys Glu Ile His Leu Tyr Gln Thr Phe
115 120 125

Val Val Gln Leu Gln Asp Pro Arg Glu Pro Arg Arg Gln Ala Thr Gln
130 135 140

Met Leu Lys Leu Gln Asn Leu Val Ile Pro Trp Ala Pro Glu Asn Leu
145 150 155 160

Thr Leu His Lys Leu Ser Glu Ser Gln Leu Glu Leu Asn Trp Asn Asn
165 170 175

Arg Phe Leu Asn His Cys Leu Glu His Leu Val Gln Tyr Arg Thr Asp
180 185 190

Trp Asp His Ser Trp Thr Glu Gln Ser Val Asp Tyr Arg His Lys Phe
195 200 205

Ser Leu Pro Ser Val Asp Gly Gln Lys Arg Tyr Thr Phe Arg Val Arg
210 215 220

Ser Arg Phe Asn Pro Leu Cys Gly Ser Ala Gln His Trp Ser Glu Trp
225 230 235 240

Ser His Pro Ile His Trp Gly Ser Asn Thr Ser Lys Glu Asn Pro Phe
245 250 255

MAILING ADDRESS OF SENDER (Please do not use customer number below):

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624 Ninth Street, NW, Suite 300
Washington, D.C. 20001-5303

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If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,416,730

Page 3 of 8

APPLICATION NO.: 10/511,722

ISSUE DATE : August 26, 2008

INVENTOR(S) : WALLACH et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Leu Phe Ala Leu Glu Ala Val Val Ile Ser Val Gly Ser Met Gly Leu
260 265 270

Ile Ile Ser Leu Leu Cys Val Tyr Phe Trp Leu Glu Arg Thr Met Pro
275 280 285

Arg Ile Pro Thr Leu Lys Asn Leu Glu Asp Leu Val Thr Glu Tyr His
290 295 300

Gly Asn Phe Ser Ala Trp Ser Gly Val Ser Lys Gly Leu Ala Glu Ser
305 310 315 320

Leu Gln Pro Asp Tyr Ser Glu Arg Leu Cys Leu Val Ser Glu Ile Pro
325 330 335

Pro Lys Gly Gly Ala Leu Gly Glu Gly Pro Gly Ala Ser Pro Cys Asn
340 345 350

Gln His Ser Pro Tyr Trp Ala Pro Pro Cys Tyr Thr Leu Lys Pro Glu
355 360 365

Thr

<210> 23
<211> 81
<212> PRT
<213> Artificial

MAILING ADDRESS OF SENDER (Please do not use customer number below):

BROWDY AND NEIMARK, P.L.L.C.
624 Ninth Street, NW, Suite 300
Washington, D.C. 20001-5303

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete. This collection is used for preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,416,730

Page 4 of 8

APPLICATION NO.: 10/511,722

ISSUE DATE : August 26, 2008

INVENTOR(S) : WALLACH et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

<220>

<223> Synthetic

<400> 23

Arg Ile Pro Thr Leu Lys Asn Leu Glu Asp Leu Val Thr Glu Tyr His
1 5 10 15

Gly Asn Phe Ser Ala Trp Ser Gly Val Ser Lys Gly Leu Ala Glu Ser
20 25 30

Leu Gln Pro Asp Tyr Ser Glu Arg Leu Cys Leu Val Ser Glu Ile Ala
35 40 45

Ala Lys Gly Gly Ala Leu Gly Glu Gly Pro Gly Ala Ser Pro Cys Asn
50 55 60

Gln His Ser Pro Tyr Trp Ala Pro Pro Cys Tyr Thr Leu Lys Pro Glu
65 70 75 80

Thr

<210> 24

<211> 81

<212> PRT

<213> Artificial

<220>

<223> Synthetic

MAILING ADDRESS OF SENDER (Please do not use customer number below):

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Page 5 of 8

PATENT NO. : 7,416,730

APPLICATION NO.: 10/511,722

ISSUE DATE : August 26, 2008

INVENTOR(S) : WALLACH et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Arg	Ile	Pro	Thr	Leu	Lys	Asn	Leu	Glu	Asp	Leu	Val	Thr	Glu	Tyr	His
1	5	10	15												

Gly	Asn	Phe	Ser	Ala	Trp	Ser	Gly	Val	Ser	Lys	Gly	Leu	Ala	Glu	Ser
20	25	30													

Leu	Gln	Pro	Asp	Tyr	Ser	Glu	Arg	Leu	Cys	Leu	Val	Ser	Glu	Ile	Pro
35	40	45													

Pro	Lys	Gly	Gly	Ala	Leu	Gly	Glu	Gly	Pro	Gly	Ala	Ser	Pro	Cys	Asn
50	55	60													

Gln	His	Ser	Pro	Tyr	Trp	Ala	Ala	Ala	Cys	Tyr	Thr	Leu	Lys	Pro	Glu
65	70	75	80												

Thr

<210> 25

<211> 81

<212> PRT

<213> Artificial

<220>

<223> Synthetic

<400> 25

Arg	Ile	Pro	Thr	Leu	Lys	Asn	Leu	Glu	Asp	Leu	Val	Thr	Glu	Tyr	His
1	5	10	15												

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ISSUE DATE : August 26, 2008

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Gly	Asn	Phe	Ser	Ala	Trp	Ser	Gly	Val	Ser	Lys	Gly	Leu	Ala	Glu	Ser
20							25							30	

Leu	Gin	Pro	Asp	Tyr	Ser	Glu	Arg	Leu	Cys	Leu	Val	Ser	Glu	Ile	Pro
35							40							45	

Pro	Ala	Gly	Gly	Ala	Leu	Gly	Gly	Pro	Gly	Ala	Ser	Pro	Cys	Asn
50							55						60	

Gln	His	Ser	Pro	Tyr	Trp	Ala	Pro	Pro	Cys	Tyr	Thr	Leu	Lys	Pro	Glu
65							70			75			80		

Thr

<210> 26
<211> 81
<212> PRT
<213> Artificial

<220>
<223> Synthetic

<400> 26

Arg	Ile	Pro	Thr	Leu	Lys	Asn	Leu	Glu	Asp	Leu	Val	Thr	Glu	Tyr	His
1							5						10		15

Gly	Asn	Phe	Ser	Ala	Trp	Ser	Gly	Val	Ser	Lys	Gly	Leu	Ala	Glu	Ser
20							25							30	

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Page 7 of 8

APPLICATION NO.: 10/511,722

ISSUE DATE : August 26, 2008

INVENTOR(S) : WALLACH et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Leu Gin Pro Asp Tyr Ser Glu Arg Leu Cys Leu Val Ser Glu Ile Pro
35 40 45

Pro Lys Gly Gly Ala Leu Gly Ala Gly Pro Gly Ala Ser Pro Cys Asn
50 55 60

Gln His Ser Pro Tyr Trp Ala Pro Pro Cys Tyr Thr Leu Lys Pro Glu
65 70 75 80

Thr

<210> 27
<211> 81
<212> PRT
<213> Artificial
<220>
<223> Synthetic
<400> 27

Arg Ile Pro Thr Leu Lys Asn Leu Glu Asp Leu Val Thr Glu Tyr His
1 5 10 15

Gly Asn Phe Ser Ala Trp Ser Gly Val Ser Lys Gly Leu Ala Glu Ser
20 25 30

Leu Gin Pro Asp Tyr Ser Glu Arg Leu Cys Leu Val Ser Glu Ile Pro
35 40 45

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APPLICATION NO. : 10/511,722

ISSUE DATE : August 26, 2008

INVENTOR(S) : WALLACH et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Pro Lys Gly Gly Ala Leu Gly Glu Gly Pro Gly Ala Ser Pro Cys Asn
50 55 60

Gln His Ser Pro Tyr Ala Ala Pro Pro Cys Tyr Thr Leu Lys Pro Glu
65 70 75 80

Thr

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